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09/514,526	02/28/2000	Donald S. Farquhar	END000006US1	8922

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EXAMINER

WINTER, GENTLE E

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 03/07/2003

12

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/514,526

Applicant(s)

FARQUHAR ET AL.

Examiner

Gentle E. Winter

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 07 January 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 18-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 18-37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 18-25 and 28-30 as amended are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, it really is not clear what is being claimed, is the claim drawn to an "electrical structure" a "conveyorized apparatus" or a method of etching. In the interests of compact prosecution the claim is assumed to be drawn to an electrical structure. As such the "conveyorized processing apparatus, said apparatus further including a spray applicator for dispensing an acid solution" and "said acid solution in continuous contact with both the chromium volume and the iron comprising body, wherein the chromium is being etched at an etch rate by said acid solution." Are deemed to be drawn to a future intended use and are therefore accorded little patentable weight. Applicant, is strongly encouraged to carefully review the language in claim 18.

### ***Claim Rejections- 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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3. Claims 18-21, and 32 are and remain rejected under 35 U.S.C. 102(b) as being anticipated by Geshner et al., U.S. Patent No. 4,105,468.
4. The claimed invention reads on Geshner as follows: Geshner discloses an electrical structure comprising a chromium volume, an iron-comprising body in continuous electrical contact with the chromium volume, and an acid solution in continuous contact with both the chromium volume and the iron-comprising body, wherein the chromium body is being etched at an etch rate; wherein the electrical structure further comprises a chromium oxide layer on the chromium volume (column 1, lines 34-46); wherein the acid solution includes a hydrochloric acid in a liquid bath form (Table 1; column 3, line 57 - column 4, line 2); wherein the acid solution includes hydrochloric acid in spray form (Table 1; column 3, lines 15-28); and wherein the chromium volume includes a layer of chromium over a layer of conductive metal (column 1, lines 39-44).
5. The elements in the claims are read in the reference.
6. Applicant's arguments are drawn to the added, future intended use language which has convoluted the claim as described in the 35 USC § 112 rejection above. For at least the foregoing the arguments are not considered persuasive.

### ***Claim Rejections -35 USC §103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains Patentability shall not be negated by the manner in which the invention was made.

7. Claim 21 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Geshner in view of Innokent, U.S. Patent No. 3,630,795.

8. Recitation of Geshner is repeated here from above.

9. In the event that Applicant disagrees with Examiner's interpretation of Geshner, Innokent discloses wherein the acid solution is in spray form (column 2, lines 55-73).

10. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the invention of Geshner in view of Innokent for the reasons explicitly set forth in Innokent, namely that micron sized fine lines can be patterned in thin films by spraying an etchant on the metallic film (column 1, lines 43-71).

11. Claims 22-25, 28, 29, 31, 33-34, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Geshner as applied to claims 18-21 above, in view of Abolafia et al U.S. Patent No. 4,370,197.

12. Recitation of Geshner is repeated here from above.

13. Geshner does not appear to explicitly disclose wherein the chromium volume includes a layer of chromium on a layer of conductive metal nor wherein the temperature and molarity of the hydrochloric acid is within a triangle space defined by temperature (T) and molarity (M) points of (21<sup>0</sup>C, 2.4M), (52<sup>0</sup>C, 2.4M), and (52<sup>0</sup>C, 1.2M). However, Abolafia discloses wherein the chromium volume includes a layer of chromium on a layer of conductive metal of copper (column 1, lines 17-23), wherein the conductive metal of copper is in contact with the acid solution of HCl (column 1, lines 38-40), wherein the temperature and molarity of the

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hydrochloric acid is within a triangle space defined by temperature (T) and molarity (M) points of (21<sup>0</sup>C, 2.4M), (52<sup>0</sup>C, 2.4M), and (52<sup>0</sup>C, 1 .2M) (column 1, lines 23-32, 44-47; column 2, lines 32-39), and wherein the etching time to remove 800 angstroms of chromium is about 30 seconds (~26.5 angstroms/second) (column 2, line 68 - column 3, line 1).

14. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the invention of Geshner in view of Abolafia for the reasons explicitly set forth Abolafia, namely that the disclosed compositions are suitable for selectively etching chrome layers without affecting the underlying copper conductive layer (column 2 lines 25-39) and that it is known to etching chromium effectively in hydrochloric acid when the chromium is in contact with copper (column 1, lines 17-23).

15. As to claims 22 and 31, it would have been obvious to etch the chromium volume by contacting the chromium volume with an iron comprising body of steel because steel itself is commercial iron which merely contains trace amounts of carbon as an alloying constituent. One would have expected to arrive at the same result by contacting the chromium volume with either an "iron-comprising body" or an "iron-comprising body [which] includes steel" because of the inherent physical, electrical, and structural similarities and properties of both conventional materials. Unless Applicant can show unexpected results, etching the chromium volume with a steel body would have been obvious. The use of conventional materials to perform their known functions in a conventional process is obvious. *In re Raner* 134 USPQ 343 (CC PA 1962).

16. Claims 22-25, 28, 29, 31, and 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Geshner and Abolafia, in view of Ricks et al., U.S. Patent No. 4,366,034.

17. Recitation of Geshner and Abolafia is repeated here from above.

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18. Neither Geshner nor Abolafia explicitly disclose wherein the iron-comprising body is steel. However, Ricks discloses wherein the iron-comprising body is steel (column 1, lines 23-28).

19. It would have been obvious to one of ordinary skill in the art at the time the invention was made to etch the chromium volume by contacting the chromium volume with an iron-comprising body of steel because Ricks teaches that good adhesion to the steel body will result by activation of reverse etching in a chrome plating solution (column 1, lines 23-28).

20. Claims 30 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Geshner as applied to claims 18-21 and 31 above in view of Blonder et al., U.S. Patent No. 5,149,404.

21. Recitation of Geshner is repeated here from above.

22. Geshner does not explicitly disclose a fluoropolymer dielectric volume bonded to the chromium volume. However, Blonder discloses wherein a photoresist volume is bonded to the chromium volume (column 1, lines 20-38).

23. It would have been obvious to one of ordinary skill in the art at the time the invention was made to bond a fluoropolymer dielectric volume to the chromium volume because fluoropolymer dielectric materials are conventionally used as photoresist masks in the etching of metallic films and the integrated electrical circuit fabrication industry and Blonder teaches that reticle masks made of chromium are ordinarily patterned by a radiation photoresist (column 1, lines 20-38). The use of conventional materials to perform their known functions in a conventional process is obvious. *In re Renner* 134 USPQ 343 (CCPA 1962).

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24. Claims 26, 27 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Geshner as applied to claims 18-21 and 31 above, in view of Bulger et al., U.S. Patent No. 4,344,223.

25. Recitation of Geshner is repeated here from above.

26. Geshner does not disclose a layer of conductive metal on the layer of chromium wherein the conductive metal includes an opening extending through its thickness, wherein the opening exposes the layer of chromium. However, Bulger discloses a layer of gold over chromium acting as an etching mask, wherein the hydrochloric acid solution is in contact with the chromium volume (column 5, lines 31-38).

27. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Geshner in view of Bulger because Bulger teaches that the gold layer over the chromium volume is an effective mask when etching a pattern in the chromium volume (column 5, lines 31-38) and results in reliable, precise thin film components (column 1, lines 52 *et seq.*). As to the limitation of wherein the iron-comprising body includes steel, it would have been obvious to etch the chromium volume by contacting the chromium volume with an iron comprising body that is steel because Geshner teaches an iron-comprising body and one of ordinary skill in the art would have arrived at the same expected results, simply because steel is commercial iron that contains trace amounts of carbon as an alloying constituent. Unless Applicant can show unexpected results, etching the chromium volume with a steel body would have been obvious.

***Response to Arguments***

With respect to the rejection of claims 18-21 under 35 U.S.C. §102(b), applicant argued:



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Applicants respectfully contend that Geshner does not anticipate claim 18, because Geshner does not teach each and every feature of claim 18 as amended herein. For example, Geshner does not teach an electrical structure comprising "a chromium volume, wherein said chromium volume is operationally positioned in a conveyorized processing apparatus, said apparatus further including an acid solution spray applicator." In contrast, Geshner is completely silent regarding the apparatus in which the method disclosed therein occurs.

28. Applicant's arguments have been considered, but are not persuasive at this time.

Specifically, the argued limitations are not properly part of the claimed electrical structure.

29. Claims 22-25, 28, and 29 were rejected under 35 USC §103(a) as unpatentable over

Geshner as applied to claims 18-21 above, in view of Abolafia. In response applicant's argued:

Applicants respectfully contend that claims 22-25, 28, and 29 are not unpatentable over Geshner and Abolafia, because Geshner and Abolafia, taken alone or in combination, do not teach or suggest each and every feature of independent claim 18 from which claims 22-25, 28, and 29 depend. For example, Geshner and Abolafia do not teach or suggest, *inter alia*, "a chromium volume, wherein said chromium volume is operationally positioned in a conveyorized processing apparatus." Rather, as noted *supra*, Geshner does not disclose an apparatus in which the method disclosed therein occurs. Similarly, Abolafia does not disclose an apparatus in which the method disclosed therein occurs.

30. Applicant's arguments have been considered, but are not persuasive at this time.

Specifically, the argued limitations are not properly part of the claimed electrical structure.

31. As to claims 22-25, 28, and 29 which were rejected under 35 USC §103(a) as

unpatentable over Geshner and Abolafia in view of Ricks, applicant's argued:

Applicants respectfully contend that claims 22-25, 28, and 29 are not unpatentable over Geshner and Abolafia in view of Ricks, because Geshner, Abolafia, and Ricks, taken alone or in combination, do not teach or suggest each and every feature of independent claim 18 from which claims 22-25, 28, and 29 depend. For example, Geshner and Abolafia, as discussed *supra*, as well as Ricks, do not teach or suggest, *inter alia*, "a chromium volume, wherein said chromium volume is operationally positioned in a conveyorized processing apparatus." Rather, as noted *supra*, Geshner and Abolafia do not disclose an apparatus in which the method disclosed therein occurs. Similarly, Ricks does not disclose an apparatus in which the method disclosed therein occurs. Further, Ricks teaches away from the instant invention, since Ricks is directed towards an electroplating process for depositing chromium onto a surface (*i.e.*, reverse etching), rather than etching chromium away from a surface. In any event, Ricks does not teach or suggest, *inter alia*, etching a chromium volume, and therefore the rejection based on Ricks is inapplicable to claim 22.

32. Applicant's arguments have been considered, but are not persuasive at this time for the reasons of record.

33. With specific respect to claim 22 applicant argued:

Regarding the feature of claim 22, "wherein said iron-comprising body includes steel," Applicants disagree with Examiner's assertion that it would be obvious to substitute an "iron-comprising body including steel" for an "iron-

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comprising body.” The Examiner does not provide any support for this assertion that there are “inherent physical, electrical, and structural similarities and properties” of both materials. Rather, Applicants suggest that evidence can be found to support the opposite view. Iron is an element, while steel is a variety of iron containing more carbon than wrought iron. Further, steel is generally known as a “hard, strong, durable malleable alloy of iron and carbon, usually containing between 0.2 and 1.5 percent carbon, often with other constituents such as manganese, chromium, nickel, molybdenum, copper, tungsten, cobalt, or silicon, depending on the desired alloy properties.” (See, American Heritage Dictionary). Regarding electrical properties, the resistivity, for example, of steel, at 20°C, varies from about 60 to about 120 ohm-cm. The resistivity of iron at the same temperature is about 10 ohm-cm. (See, Handbook of Physics and Chemistry). Applicants respectfully submit, therefore, that there are sufficient differences between an iron-comprising body including steel” and an iron-comprising body” that their interchange or substitution would not be obvious.

34. Applicant’s arguments have been considered, but are not persuasive at this time. It is assumed that applicant is not suggesting that “iron comprising body” would not include steel.

Rather applicant appears to make arguments to certain properties of the iron comprising body that includes steel. If applicant wants to have the limitations described, they should be included in the claim limitations as through a CIP as the limitations do not appear to be in the specification, as it was originally filed.

35. It is noted that new claim 31 is essentially the same as claim 22 prior to the most recent amendment of claim 18, and that the arguments presented in conjunction with the inclusion of steel in claim 22 also apply to new claim 31.

36.

### ***Conclusion***

37. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

38. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

39. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gentle E. Winter whose telephone number is (703) 305-3403.

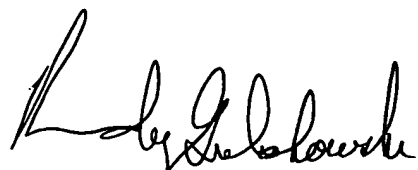
The examiner can normally be reached on Monday-Friday 7:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on (703) 308-4333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Gentle E. Winter  
Examiner  
Art Unit 1746

gew  
March 5, 2003

  
RANDY GULAKOWSKI  
SUPERVISORY PATENT EXAMINER  
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